

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A communication system which performs data communication by a discrete multi-tone modem scheme between a plurality of data communication units using a the time-division half-duplex communication function, comprising:

a setting unit configured to set a data transmission time and a quasi-data transmission time within each cycle of a periodic timing, the data transmission time being better suited for data transmission with respect to interference noise than the quasi-data transmission time, wherein the ratio between the data transmission time ~~suitable for data transmission~~ and the quasi-data transmission time ~~other than the data transmission time~~ within each cycle of the periodic timing is set of a uniform data rate changes dynamically; and;

an assigning unit configured to:

obtain bits of data according to a uniform data rate,

assign the uniformly obtained ~~characterized in that~~ bits of data for transmission ~~obtained according to the periodic timing uniform data rate are assigned in such a manner that~~ the data bits uniformly obtained during a given period equivalent to the cycle time of the periodic timing are transmitted during the data transmission time of one cycle of the periodic timing, and wherein

assign dummy bits are assigned to the portion of the data transmission time of the one cycle to which no data bits have been assigned.

2. (Currently Amended) A communication system which performs data communication by a discrete multi-tone modem scheme between a plurality of data communication units using a

~~the~~ time-division half-duplex communication function, comprising:

a setting unit configured to set a data transmission time and a quasi-transmission time within each cycle of a periodic timing, the data transmission time being particularly suited for data transmission with respect to interference noise than the quasi-data transmission time, wherein the ratio between the data transmission time ~~suitable for data transmission~~ and the quasi-data transmission time ~~other than the data transmission time~~ within each cycle of the periodic timing is set ~~of a uniform data rate changes dynamically; and ;~~

an assigning unit configured to:

_____ obtain bits of data according to a uniform data rate,

_____ assign the uniformly obtained ~~characterized in that~~ bits of data for transmission ~~obtained according to the periodic timing uniform data rate are assigned~~ in such a manner that the data bits uniformly obtained during a given period equivalent to the cycle time of the periodic timing are transmitted during the data transmission time and the quasi-data transmission time of one cycle of the periodic timing, and ~~wherein~~

_____ assign dummy bits ~~are assigned~~ to the portion of the ~~data transmission time and the portion of the~~ quasi-data transmission time of the one cycle to which no data bits have been assigned.

3. (Currently Amended) The communication system according to claim 1, further comprising: ~~characterized by appropriately~~

a selecting unit configured to select between a low transmission delay mode in which bits are assigned in such a manner that the data bits uniformly obtained during the a-given period are

transmitted during the data transmission time of the one cycle period and dummy bits are assigned to the portion of the data transmission time of the one cycle to which no data bits have been assigned, and ~~or~~ a normal mode in which the data bits uniformly obtained during the a given period are assigned uniformly over the data transmission time of the one cycle, and the wherein the uniformly obtained data bits for the obtained data are assigned in accordance with the selected mode.

4. (Currently Amended) The communication system according to claim 2, further comprising: ~~characterized by appropriately~~

a selecting unit configured to select between a low transmission delay mode in which the data bits uniformly obtained during the a given period are assigned to the data transmission time and the quasi-data transmission time of the one cycle period and dummy bits are assigned to the portion of the ~~data transmission time and the~~ quasi-data transmission time of the one cycle to which no data bits have been assigned, and ~~or~~ a normal mode in which the data bits uniformly obtained during the a given period are assigned uniformly over the data transmission time of the one cycle, and

wherein the uniformly obtained data bits for the obtained data to be transmitted are assigned in accordance with the selected mode.

5. (Currently Amended) A communication system which performs data communication by a discrete multi-tone modem scheme between a plurality of data communication units using a ~~the~~ time-division half-duplex communication function, comprising:

a setting unit configured to set a data transmission time and a quasi-data transmission time within each cycle of a periodic timing, the data transmission time being better suited for data transmission with respect to interference noise than the quasi-data transmission time, wherein the ratio between the data transmission time ~~suitable for data transmission~~ and the quasi-data transmission time ~~other than the data transmission time~~ within each cycle of the periodic timing is set ~~of a uniform data rate changes dynamically; and ;~~

a receiving unit configured to:

receive data bits assigned to the data transmission time of each cycle of the periodic timing, and

reproduce the received ~~characterized in that~~ data bits ~~are reproduced~~ according to ~~a the~~ uniform data rate, such that ~~all the~~ received data bits assigned to the data transmission time of one cycle of the periodic timing are uniformly reproduced during a given period equivalent to the cycle time of the periodic timing. ~~are reproduced from received data that was assigned to the data transmission time of one period.~~

6. (Currently Amended) A communication system which performs data communication by a discrete multi-tone modem scheme between a plurality of data communication units using a ~~the~~ time-division half-duplex communication function, comprising:

a setting unit configured to set a data transmission time and a quasi-data transmission time within each cycle of a periodic timing, the data transmission time being better suited for data transmission with respect to interference noise than the quasi-data transmission time, wherein the ratio between the data transmission time suitable for data transmission and the quasi-

data transmission time other than the data transmission time within each cycle of the periodic timing is set ~~of a uniform data rate changes dynamically; and ;~~

a receiving unit configured to:

receive data bits assigned to the data transmission time and quasi-data transmission time of each cycle of the periodic timing, and

reproduce the received ~~characterized in that~~ data bits ~~are reproduced~~ according to ~~a the~~ uniform data rate, such that ~~all the~~ received data bits assigned to the data transmission time and quasi-data transmission of one cycle of the periodic timing are uniformly reproduced during for a given period equivalent to the cycle time of the periodic timing. ~~are reproduced from received data that was assigned to the data transmission time and the quasi data transmission time of one period.~~

7. (Currently Amended) The communication system according to claim 5, further comprising: ~~characterized by appropriately~~

a selecting unit configured to select between a low transmission delay mode in which bits are assigned in such a manner that the data bits to be uniformly reproduced during the a given period are transmitted during the data transmission time of the one cycle period and dummy bits are assigned to the portion of the data transmission time of the one cycle to which no data bits have been assigned, and ~~or~~ a normal mode in which the data bits to be uniformly reproduced during the a given period are assigned uniformly over the data transmission time of the one cycle, and

wherein the received data bits are reproduced in accordance with the selected mode.

8. (Currently Amended) The communication system according to claim 6, further comprising: characterized by appropriately

a selecting unit configured to select between a low transmission delay mode in which bits are assigned in such a manner that the data bits to be uniformly reproduced during the a-given period are transmitted during the data transmission time and the quasi-data transmission time of the one cycle period and dummy bits are assigned to the portion of the data transmission time and the quasi-data transmission time of the one cycle to which no data bits have been assigned, and or a normal mode in which the data bits to be uniformly reproduced during the a-given period are assigned uniformly over the data transmission time of the one cycle, and

wherein the received data bits are reproduced in accordance with the selected mode.

9. (Currently Amended) A communication method of performing data communication by a discrete multi-tone modem scheme between a plurality of data communication units using a the time-division half-duplex communication function, comprising:

setting a data transmission time and a quasi-data transmission time within each cycle of a periodic timing, the data transmission time being better suited for data transmission with respect to interference noise than the quasi-data transmission time, wherein the ratio between the data transmission time suitable for data transmission and the quasi-data transmission time other than the data transmission time within each cycle of the periodic timing of a uniform data rate changes dynamically;

obtaining bits of data according to a uniform data rate;

assigning the uniformly obtained ~~characterized in that~~ bits of data for transmission ~~obtained according to the periodic timing uniform data rate are assigned in such a manner that~~ the data bits uniformly obtained during a given period equivalent to the cycle time of the periodic timing ~~are is-transmitted during the data transmission time of one cycle of the periodic timing;~~ and wherein

assigning dummy bits ~~are assigned to the portion of the data transmission time of the one~~ cycle to which no data bits have been assigned.

10. (Currently Amended) A communication method of performing data communication by a discrete multi-tone modem scheme between a plurality of data communication units using a ~~the~~ time-division half-duplex communication function, comprising:

setting a data transmission time and a quasi-data transmission time within each cycle of a periodic timing, the data transmission time being better suited for data transmission with respect to interference noise than the quasi-data transmission time, wherein the ratio between the data transmission time ~~suitable for data transmission~~ and the quasi-data transmission time other than the data transmission time within each cycle of the periodic timing is set ~~of a uniform data rate changes dynamically;~~

obtaining bits of data according to a uniform data rate;

assigning the uniformly obtained ~~characterized in that~~ bits of data for transmission ~~obtained according to the periodic timing uniform data rate are assigned in such a manner that~~ the data bits uniformly obtained during a given period equivalent to the cycle time of the periodic timing ~~are is-transmitted during the data transmission time and the quasi-data transmission time~~

of one cycle of the periodic timing; and wherein

assigning dummy bits ~~are assigned~~ to the portion of the ~~data transmission time and the~~
~~portion of the~~ quasi-data transmission of the one cycle to which no data bits have been assigned.

11. (Currently Amended) The communication method according to claim 9, further
comprising: characterized by appropriately

selecting between a low transmission delay mode in which bits are assigned in such a
manner that the data bits uniformly obtained during the ~~a~~-given period are transmitted during the
data transmission time of the one cycle period and dummy bits are assigned to the portion of the
data transmission time during the one cycle to which no data bits have been assigned, and ~~or~~ a
normal mode in which the data bits uniformly obtained during the ~~a~~-given period are assigned
uniformly over the data transmission time of the one cycle, and

wherein the uniformly obtained bits are assigned in accordance with the selected mode.

12. (Currently Amended) The communication method according to claim 10, further
comprising: characterized by appropriately

selecting between a low transmission delay mode in which the data bits uniformly
obtained during the ~~a~~-given period are assigned to the data transmission time and the quasi-data
transmission time of the one cycle period and dummy bits are assigned to the portion of ~~the data~~
~~transmission time and the~~ quasi-data transmission time of the one cycle to which no data bits
have been assigned, and ~~or~~ a normal mode in which the data bits obtained uniformly during the ~~a~~
given period are assigned uniformly over the data transmission time of the one cycle, and

wherein the uniformly obtained data bits for the obtained data are assigned in accordance with the selected mode.

13. (Currently Amended) A communication method of performing data communication by a discrete multi-tone modem scheme between a plurality of data communication units using a the time-division half-duplex communication function, comprising:

setting a data transmission time and a quasi-data transmission time within each cycle of a periodic timing, the data transmission time being better suited for data transmission with respect to interference noise than the quasi-data transmission time, wherein the ratio between the data transmission time suitable for data transmission and the quasi-data transmission time other than the data transmission time within each cycle of the periodic timing is set of a uniform data rate changes dynamically;

receiving data bits assigned to the data transmission time of each cycle of the periodic timing; and

reproducing the received characterized in that data bits are reproduced according to a the uniform data rate, such that all the received data bits assigned to the data transmission time of one cycle of the periodic timing are uniformly reproduced during a given period equivalent to the cycle time of the periodic timing. are reproduced from received data that was assigned to the data transmission time of one period.

14. (Currently Amended) A communication method of performing data communication by a discrete multi-tone modem scheme between a plurality of data communication units using a

~~the~~ time-division half-duplex communication function, comprising:

setting a data transmission time and a quasi-data transmission time within each cycle of a periodic timing, the data transmission time being better suited for data transmission with respect to interference noise than the quasi-data transmission time, wherein the ratio between the data transmission time suitable for data transmission and the quasi-data transmission time other than the data transmission time within each cycle of the periodic timing is set of a uniform data rate changes dynamically;

receiving data bits assigned to the data transmission time and quasi-data transmission time of each cycle of the periodic timing;

reproducing the received ~~characterized in that~~ data bits ~~are reproduced~~ according to a the uniform data rate, such that all the received data bits assigned to the data transmission time and quasi-data transmission time of one cycle of the periodic timing are uniformly reproduced during ~~for a given period equivalent to the cycle time of the periodic timing. are reproduced from received data assigned to the data transmission time and the quasi-data transmission time of one period.~~

15. (Currently Amended) The communication method according to claim 13, further comprising: characterized by appropriately

selecting between a low transmission delay mode in which bits are assigned in such a manner that the data bits to be uniformly reproduced during the a-given period are transmitted during the data transmission time of the one cycle period and dummy bits are assigned to the portion of the data transmission time of the one cycle to which no data bits have been assigned,

~~and~~ ~~or~~ a normal mode in which the data bits to be uniformly reproduced are assigned uniformly over the data transmission time of the one cycle, ~~and~~

wherein the received data bits are reproduced in accordance with the selected mode.

16. (Currently Amended) The communication method according to claim 14, further comprising: ~~characterized by appropriately~~

selecting between a low transmission delay mode in which bits are assigned in such a manner that the data bits to be uniformly reproduced during the a-given period are transmitted during the data transmission time and the quasi-data transmission time of the one cycle period and dummy bits are assigned to the portion of ~~the data transmission time and the~~ quasi-data transmission time of the one cycle to which no data bits have been assigned, ~~and~~ ~~or~~ a normal mode in which the data to be uniformly reproduced are assigned uniformly over the data transmission time of the one cycle, ~~and~~

wherein the received data bits are reproduced in accordance with the selected mode.

17. (New) A data transmitting apparatus comprising:

a rate converter configured to produce an output data stream including a set of output symbols, each set being defined based on cyclic ISDN noise by performing rate conversion over an input data stream including a plurality of input symbols, each input symbol having a time length different from a time length of each of the output symbols;

a FEXT symbol deciding unit configured to decide a plurality of specific output symbols in each of the output symbols as FEXT symbols that are suitable for data transmission in terms of the cyclic ISDN noise; and

an assigning unit configured to assign data to the FEXT symbols in each of the set, the assigned data being included in a certain number of the input symbols having a total time length corresponding to a time length of one cycle of the ISDN noise.